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A synthesis of narwhal (*Monodon monoceros*) scientific advice and Inuit knowledge collected during Nunavut community consultations (May 25-31, 2011)

Synthèse des avis scientifiques et du savoir inuit sur les narvals (*Monodon monoceros*) transmis lors des consultations communautaires au Nunavut (tenues du 25 au 31 mai 2011)

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ABSTRACT

This report includes a synthesis of the available Fisheries and Oceans Canada (DFO) scientific advice related to narwhals and the Inuit knowledge collected during Nunavut community consultations (May 25-31, 2011). Six communities were visited during the consultation tour: Clyde River, Pond Inlet, Arctic Bay, Resolute, Igloolik, and Qikiqtarjuaq. In addition, residents of Hall Beach and Pangnirtung attended meetings in Igloolik and Qikiqtarjuaq, respectively. In general, the scientific advice and the Inuit knowledge shared during the community consultations complement each other, but there are also some areas where the two types of information diverge. Inuit knowledge has the potential to complement scientific advice and to enhance our current understanding of narwhals, particularly with respect to observational data such as life history characteristics, habitat use, behaviour, and seasonal movements.

RÉSUMÉ

Le présent rapport comprend une synthèse des avis scientifiques de Pêches et Océans Canada (MPO) sur les narvals et le savoir inuit transmis lors des consultations communautaires qui ont eu lieu au Nunavut du 25 au 31 mai 2011. Six communautés ont été visitées pendant la tournée de consultation : Clyde River, Pond Inlet, Arctic Bay, Resolute Bay, Igloolik et Qikiqtarjuaq. De plus, les résidents de Hall Beach et de Pangnirtung ont assisté à des réunions à Igloolik et à Qikiqtarjuaq, respectivement. En général, les avis scientifiques et le savoir inuit transmis lors des consultations communautaires se complètent, mais ils divergent sur quelques plans. Le savoir inuit vient compléter les avis scientifiques et nous permet d'approfondir nos connaissances sur les narvals, surtout en ce qui a trait aux données d'observation, telles que les caractéristiques du cycle biologique, les habitats utilisés, le comportement et les déplacements saisonniers.

CONTEXT

Five officials from Fisheries and Oceans Canada (DFO), along with observers from the Government of Nunavut (Department of Environment), the Nunavut Wildlife Management Board (NWMB), and Nunavut Tunngavik Incorporated (NTI) visited six Nunavut communities (Clyde River, Pond Inlet, Arctic Bay, Resolute, Igloolik, and Qikiqtarjuaq) from May 25-31, 2011. In addition, members from the Hunters and Trappers Organisations of Hall Beach and Pangnirtung attended meetings in Igloolik and Qikiqtarjuaq, respectively. Although the delegation intended to visit Grise Fjord, this was not possible owing to inclement weather conditions.

The primary objectives of the consultations were to:

1) Promote a better understanding of the available scientific advice related to narwhal abundance and the proposed summering stock hypothesis;
2) Explain the process related to Canada's responsibilities under the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) with respect to non-detriment findings (NDF) and issuing export permits;
3) Seek comments, perspectives, and traditional knowledge/expert opinions from Inuit harvesters and community members on the information presented; and
4) Promote relationship-building and continued engagement between DFO and Inuit communities.

Presentations covering two main themes (i.e. current scientific advice for narwhals and an overview of CITES) were given at each of the meetings. Participants were encouraged to comment, ask questions, and to share their knowledge and expertise related to the topics discussed; the information provided by Inuit participants at the various meetings is referred to as "Inuit knowledge" for the purposes of this report.

The purpose of the community consultation tour was not specifically to collect Inuit traditional knowledge and a formal study for this purpose was not conducted. Nonetheless, along with general comments and concerns, community members shared Inuit knowledge and expertise during the various discussions in response to the information presented. This report summarises the Inuit knowledge specifically related to narwhal in each of the communities visited and a synthesis of this information, along with the current DFO scientific advice on narwhals, is provided.

Although other topics/issues were also raised during the community consultations (e.g. climate change impacts, natural resource extraction impacts), this information was not considered relevant with respect to the narwhal non-detriment finding assessment and is thus not included in this report.

RESULTS

The current Departmental scientific advice related to narwhals and the Inuit knowledge collected through the community consultations has been summarised in Table 1. This information has been separated into different themes including stock delineation, narwhal abundance, etc. and an analysis of whether the Inuit knowledge is consistent among the communities visited, as well as with the available narwhal scientific advice is also provided.

KEY SOURCES OF UNCERTAINTY

- The Inuit knowledge included in this report was not collected via a formal study dedicated to the collection of traditional ecological knowledge related to narwhals and did not follow specific methods to ensure reliability of data collection.
- Participants of the community consultations may not fully or appropriately represent the full suite of expertise available in the communities visited, or the views that may exist in communities that were not visited.
- The temporal and/or spatial scales of the scientific advice and the Inuit knowledge provided are likely different.

CONCLUSIONS

In general, the Inuit knowledge heard during the aforementioned community consultations are consistent with the available Departmental scientific advice on narwhals.

More specifically, the available scientific advice and the Inuit knowledge are in agreement that:

a) Physical differences exist between different groups of narwhals and these differences seem related to summering aggregations;
b) Narwhals return to the same area each summer in order to utilise the same habitat features;
c) The Baffin Bay population of narwhals is healthy and abundant; and
d) Narwhals comprising the "putative stocks" of Parry Channel, Jones Sound, and Smith Sound exhibit physical and behavioural differences compared to those in other summering areas and narwhals from these areas do not mix with narwhals in other areas during the summer season.

Although there are a number of complementarities between the available scientific advice and the Inuit knowledge shared during the community consultations, there is some divergence of ideas between these two types of information. For example, the Inuit knowledge does not agree that the scientific advice available necessarily justifies different narwhal 'stocks'. Furthermore, given that the Baffin Bay population as a whole is abundant, the idea of managing harvest rates at the summering aggregation scale was not necessarily supported.

Inuit knowledge has the potential to complement scientific advice and to enhance our current understanding of narwhals, particularly with respect to observational data such as life history characteristics, habitat use, behaviour, and seasonal movements.

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Table 1. Summary of the current scientific advice related to narwhals and the Inuit knowledge collected through the Nunavut community consultations on May 25-31, 2011. The communities consulted were: Clyde River, Pond Inlet, Arctic Bay, Resolute, Igloolik, and Qikiqtarjuaq. In addition, residents of Hall Beach and Pangnirtung also participated in the meetings in Igloolik and Qikiqtarjuaq, respectively.

Topic	Current DFO Scientific Advice	Inuit Knowledge (separated by the community in which it was heard)	Analysis
Narwhal Stock Delineation	There are two narwhal populations in Canada; the Baffin Bay population and the Northern Hudson Bay population, the latter of which is genetically distinct. Based on behaviour, genetics, contaminant analysis, and stable isotope profiles, Baffin Bay narwhals can be delineated into at least five summering aggregations, in addition to the stock/population of Northern Hudson Bay. The proposed summering aggregations are: Somerset Island, Eclipse Sound, Admiralty Inlet, East Baffin Island, and Northern Hudson Bay. There is also a group of narwhals that summer in the high Arctic (Parry Channel, Jones Sound, and Smith Sound) for which very little scientific information is available with respect to stock delineation.	*Pond Inlet* • Different stocks of narwhals exist and they can be distinguished from one another based on colouring, shape of tail, and tusk characteristics (e.g. extent the tusk is spiralled, length, thickness). • Narwhals always return to their original habitats. • Narwhals in Lancaster Sound and the opening of the Arctic Bay, Tremblay Bay, and Eclipse Sound fjords form three distinct groups but not in the sense of stocks (i.e. males, juveniles, and females). The whales in these groups migrate to specific summer areas and exhibit different habits. Narwhals from these groups do not mix during migration unless killer whales are present, but will mix during the summer to mate. *Arctic Bay* • Arctic Bay and Pond Inlet hunters believe they share the same stock because narwhals travel north in the summer past all of the communities. • Greenland stock is shared with Admiralty Inlet because hunters have seen wound marks that indicate the	There is agreement among the communities visited that there are physical differences between different groups of narwhals which seem to be related to the summering aggregations. This information is consistent with the current scientific advice. There is general agreement that narwhals return to their same summering habitats each year. This information is consistent with the current scientific advice. There are differing views among the communities visited as to whether these physical and behavioural differences constitute "stocks". However, it is the minority view that does not support this hypothesis and given the information provided it seems as though this disagreement is more rooted in a misunderstanding of the scientific advice, rather than a disagreement with the

Topic	Current DFO Scientific Advice	Inuit Knowledge (separated by the community in which it was heard)	Analysis
		different hunting methods used by the different communities. • Several community members noted that different stocks cannot exist because narwhals can move wherever they want to and do not stay in the same place. • Narwhals seen in Admiralty Inlet have different behaviour, colouration, tusk length, and tusk shape than narwhals in other areas. *Igloolik* • The idea of stocks is not new to Inuit who have known that there are differences between the Somerset and Northern Hudson Bay stocks. Narwhals from the north are smaller than those in Northern Hudson Bay. • There are two stocks of narwhals near Igloolik and Hall Beach – one to the north and one in Northern Hudson Bay. Narwhals migrate to these areas following the floe edge and cracks in the ice prior to the spring break-up. • There is a different group of narwhals in Lyon Inlet that potentially should be considered their own stock. *Qikiqtarjuaq* • There is an additional stock near Qikiqtarjuaq as some narwhals stay in the area of Home Bay during the summer.	actual hypothesis.

Topic	Current DFO Scientific Advice	Inuit Knowledge (separated by the community in which it was heard)	Analysis
		• Greenland and Canada may share the same population of narwhals. • Hunters in Qikiqtarjuaq are harvesting different narwhals than the hunters in Clyde River.	
Information specific to the Putative Stocks of Parry Channel, Jones Sound, and Smith Sound	These three stocks are hypothesized based on the occurrence of animals in the areas of Parry Channel, Jones Sound, and Smith Sound and given that, for other narwhal stocks, there is evidence of site fidelity and restricted geographic movements during the summer. However, there is no specific data to draw any clear statements on the distinctiveness of their range or genetic make-up.	*Pond Inlet* • The narwhals near Resolute Bay are much different than those near Pond Inlet. • Narwhals may be summering near Resolute Bay to benefit from more ice cover and food. • Resolute Bay narwhals travel to the Grise Fjord area, as do narwhals that frequent the Lancaster Sound area. • Smith Sound narwhals enter through the Jones Sound area and move into the Parry Channel during the summer. Narwhals in this area are larger than Pond Inlet narwhals and have thicker tusks. • Narwhals near Grise Fjord likely do not mix very often with other Baffin stocks and are probably limited to the Devon Island and Dundas Harbour areas. • Dundas Harbour is a mating area for narwhals. Narwhals in this area are numerous and have long tusks. • Narwhals that spend the summer in the Smith Sound area move along Devon Island and Ellesmere Island but do not come south to Pond Inlet in the	The information provided during the community consultations generally supports the hypothesis that, at minimum, narwhals in these areas exhibit physical and behavioural differences compared to those in other areas and that they do not mix with narwhals in other areas during the summer. This information is consistent with the limited scientific advice on narwhals in the putative stocks of Parry Channel, Jones Sound, and Smith Sound.

Topic	Current DFO Scientific Advice	Inuit Knowledge (separated by the community in which it was heard)	Analysis
		summer. During the winter these whales probably mix with other whales in Baffin Bay. These whales are more difficult to hunt than narwhals from other areas.	
Narwhal Abundance	Current abundance estimates indicate that the Baffin Bay population of narwhals is abundant with an estimate of approximately 80,000 individuals. The Northern Hudson Bay population is much smaller with an estimated abundance of approximately 5000 individuals. Narwhal abundance in each of the summering aggregations varies between 5000 and 45,000 individuals depending on the stock.	*Pond Inlet* • Inuit observations indicate that narwhals are numerous. However, there are fewer narwhals in the area near Pond Inlet compared to the past – this may be the result of increased ship traffic and noise. • Narwhals are numerous in the area of Dundas Harbour and also during the migrations near Pond Inlet; there are continuously whales passing by until the ice freezes each fall. *Arctic Bay* • Narwhals in Eclipse Sound have declined in recent years and this is likely due to increased ship traffic. • There are many narwhals in Admiralty Inlet in the summer, many more than Pond Inlet. Narwhals are increasing in Admiralty Inlet. • Resolute Bay never used to see narwhals and now they are seeing more, perhaps because of the availability of ice cover.	There is agreement between the information provided by the Inuit meeting participants and the current scientific advice that the Baffin Bay population of narwhals are healthy and abundant. The summering aggregations are healthy and also abundant as indicated by the locally-specific comments provided in each community. In general this is consistent with the scientific advice for the Baffin Bay stocks. However, the status of the narwhals was not discussed in the context relative to harvest rates which is an important consideration.

Topic	Current DFO Scientific Advice	Inuit Knowledge (separated by the community in which it was heard)	Analysis
		Resolute • Hunters in Creswell Bay are not seeing as many narwhals as in the past. • It is only in the last five years that narwhals have been observed regularly in Resolute Bay. *Igloolik* • There are many narwhals in this area – too many to count. • There are fewer narwhals in the Melville Bay area; narwhals are now congregating in Repulse Bay to calve. *Qikiqtarjuaq* • Narwhals are very abundant in this area, particularly during migration. The fall migration has more whales than the spring migration. • There are many yearlings and calves observed recently in this area, and there are so many juveniles they are difficult to count. • The narwhals that remain in Home Bay during the summer are very abundant, perhaps more so than those in the Pond Inlet area.	
Narwhal Seasonal Movements	Satellite tagging information indicates that narwhals from the summering aggregations of East Baffin Island, Somerset Island, Admiralty Inlet, and Eclipse	*Clyde River* • The narwhals come from the south in the spring. Some narwhals remain in the area during the summer months, but most of the animals spend the summer	There is agreement between the information provided by the Inuit community members who attended the meetings and the current scientific advice with

Topic	Current DFO Scientific Advice	Inuit Knowledge (separated by the community in which it was heard)	Analysis
	Sound likely overwinter in the middle and east waters of Baffin Bay. Each spring these animals migrate north along east Baffin Island to their summering habitats, and each fall they reverse this movement to return to their overwintering grounds. It is unknown where narwhals from the putative stocks overwinter or exactly which migratory routes these animals utilise. Narwhals from the Northern Hudson Bay stock have a summer range within Foxe Basin and migrate through the Hudson Strait to their overwintering grounds. It is unknown exactly where the winter habitat is located for this stock, but it is thought to be near the mouth of the Hudson Strait.	further north. • Narwhals do not migrate in a straight line, they also enter the fjords. Narwhals from Pond Inlet and Eclipse Sound come to Clyde River. *Pond Inlet* • Narwhals migrate to their summer habitat each spring and in September they migrate in the other direction – some through Eclipse Sound and others through Lancaster Sound. • Narwhals usually remain in the same area for the duration of the summer. However, periodically Inuit see narwhals travelling near the shore; they are always moving, likely searching for food. • Narwhals tagged in the Clyde River area have been observed at the floe edge in Pond Inlet. • During migration, the adult males with long tusks arrive first, followed by pregnant females, and then darker, medium-sized narwhals which are the best food. This separation isn't as obvious during the fall migration. *Arctic Bay* • Narwhals from Greenland winter in Baffin Bay and narwhals from Admiralty Inlet travel with narwhals from Pond Inlet, Clyde River, and Qikiqtarjuaq to	respect to the seasonal movements of narwhals. This information is also related and supports the aforementioned comments regarding narwhal stock delineation.

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		Creswell Bay area during the winter. • One narwhal harpooned in Pond Inlet was observed in Taloyoak. • There is less ice near Greenland so narwhals may be moving more west and possibly north. *Igloolik* • Narwhals remain in the Hecla Strait during the winter. • Narwhals in Northern Hudson Bay come from the Iqaluit area during the spring migration. *Qikiqtarjuaq* • Narwhals travel past this area on their way to Clyde River, Pangnirtung, and Arctic Bay. • Narwhals are present near Cape Dyer in the winter and also in the Davis Strait; they travel along East Baffin Island in the spring.	
Community Narwhal Harvest Characteristics	Results from the analysis of the 2006-2011 narwhal tagging data show that annual landed catches of narwhal by several communities appeared relatively stable from 2006-2010 (e.g. Arctic Bay), while others demonstrated more pronounced inter-annual variability (e.g. Pond Inlet, Clyde River).	*Pond Inlet* • Baffin Bay narwhals are easier to harvest than those from Greenland which periodically are found near Pond Inlet. *Igloolik* • Harvesters in Igloolik hunt the Somerset stock and also the Northern Hudson Bay stock near Repulse Bay.	Date and location of harvest is important information to collect in order to assign each harvest to its appropriate summering aggregation. This information is especially critical in communities that harvest migrating narwhals or in communities that have

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	Among the western communities, those which typically harvest more than a few narwhal annually (e.g. Igloolik, Taloyoak) showed a marked decline in harvest from 2006 to 2007, and remained relatively stable and low thereafter. For all years and all communities combined, 18% of the narwhal harvest takes place in spring (earlier than July 24th), 72% in summer (July 25th - October 1st), and 10% in fall (after October 1st).	• Narwhals from Northern Hudson Bay can be harvested in the winter. • Hall Beach hunters harvest from the Steensby Inlet area and not very often from Northern Hudson Bay. *Qikiqtarjuaq* • Hunters from Qikiqtarjuaq harvest narwhals from the high Arctic but the majority of harvests are from a local stock that stays in the area during the summer in Home Bay.	access to more than one summering aggregation depending on where harvests occur.